

REMARKS

The Office Action dated September 2, 2003 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 27-51 are pending in the application. Applicant has amended claims 27 and 43 to more particularly point out and distinctly claim the present invention. No new matter has been added. In view of the following remarks, reconsideration and allowance of these claims are respectfully requested.

I. CLAIM REJECTIONS UNDER 35 USC § 103

Claims 27-38 and 43-51 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dennison et al.* (US 5,546,445) in view of *Zadeh* (U.S. Patent No. 6,324,406). The Office Action took the position that *Dennison* discloses all of the elements of the claimed invention of claims 27-38 and 43-51, with the exception of disclosing a step of deciding on the basis of the result of the processing step, whether a first handover condition based on location information is fulfilled or not, when the first handover condition is not fulfilled, checking subscriber specifications, whether or not another measurement related to a handover is to be performed, wherein the another measurement results in a determination of a second handover condition. The Office Action also conceded that *Dennison* fails to disclose a step of designating a next base transceiver station in the communication network, to which the communication with the mobile station is to be directed from a current base transceiver station, when the first

handover or the second handover condition is fulfilled. *Zadeh* was cited as curing the deficiencies in *Dennison*, and the Office Action took the position that it would have been obvious to a person of ordinary skill in the art to combine *Dennison* and *Zadeh* to yield the claimed invention. Applicant respectfully submits that the presently pending claims recite subject matter which is neither disclosed nor suggested in the cited prior art.

Claim 27, upon which claims 28-42 are dependent, recites a method for performing a handover procedure for a mobile station communicating in a communication network and being movable therein. The communication network comprises a plurality of base transceiver stations being adapted to perform a communication with the mobile station within a coverage area of a respective one of the base transceiver stations. The method comprises a processing step, a deciding step, a designating step, a triggering step and a performing step. The processing step processes location information related to the mobile station by comparing position information of the mobile station with position information related to the base transceiver stations. The deciding step decides on the basis of the results of the processing of the location information, whether a first handover condition based on location information is fulfilled or not. The first handover condition is based on the location information and indicates that a handover is necessary for establishing or maintaining the communication between the mobile station and the communication network. When the first handover condition is not fulfilled, the deciding step also checks subscriber specifications to decide whether or not another measurement, which is related to a handover and is not based on the location

information, is to be performed, wherein another measurement results in a determination of a second handover condition. The second handover condition indicates that a handover is necessary for establishing or maintaining the communication between the mobile station and the communication network. The designating step designates a next base transceiver station in the communication network, to which the communication with the mobile station is to be directed from a current base transceiver station, when the first handover or the second handover condition is fulfilled. The triggering step triggers a handover of the communication connection of the mobile station from the current base transceiver to the next base transceiver station designated in the designation step. The performing step performs the handover.

Independent claim 43, upon which claims 44-51 are dependent, is similar to claim 27, but is directed to a device for controlling a handover procedure for a mobile station communication in a communication network and being movable therein.

As discussed in the present specification, a method and device for performing handovers using location information is provided. The invention employs location information which is, for example, periodically determined to decide whether a handover is to be performed and to which base transceiver station the communication is to be changed. One advantage of the present invention is that the base transceiver stations can be intermittently turned off when their services are not needed. Namely, a base transceiver station may be turned on by a corresponding base station controller only when a mobile station enters the base transceiver station's coverage area. This is a cost saving

feature of an embodiment of the invention, and it also reduces power consumption. It is respectfully submitted that the prior art of *Dennison* and *Zadeh*, when viewed singly or when combined, fails to disclose or suggest the elements of any of the presently pending claims. Therefore, the prior art fails to provide the critical and unobvious advantages discussed above.

Dennison discloses a cellular telephone system including a plurality of cell sites and a mobile telephone switching office. Call management, including selection of a cell site most appropriate for a call associated with a mobile unit, is made based on the geographic location of the mobile unit as opposed to the strength of the signal associated with the call.

Zadeh discloses a mobile positioning center (MPC) 20 that derives the location of mobile station 150 by utilizing the Timing Advance (TA) values from at least three BTS's to calculate the distances between mobile station 150 and the BTS's. MPC 20 uses the geographical coordinates of the BTS's and the calculated distances between the mobile station and the BTS's to derive the location of the mobile station. When the location of mobile station 150 is required (by a public safety system, for example), MPC 20 sends a request for TA values to MSC 14. MSC 14 forwards the request to BSC 32, which is connected to the serving BTS 50. BSC 32 obtains the TA value from serving BTS 50. BSC 32 uses the hand over candidate list of mobile station 150 to determine which BTS's to obtain further TA values from. BTS's 54, 56 and 52 are on the handover candidate list, ranked in that order from best candidate to poorest candidate for handover. BSC 32

causes mobile station 150 to initiate a first handover to BTS 54 to the best candidate on the handover candidate list, and reserves the current communication channel. BTS 54 generates a TA value as part of the handover procedure. After the handover to BTS 54 is completed, BSC 32 causes mobile station 150 to initiate a handover back to serving BTS 50, on the reserved channel. This handover is also completed. Zadeh contends that the handover back to the original serving BTS facilitates stability of any voice or data call back to a previously stable link to mobile station 150. Zadeh further states that the handover back to the original BTS further facilitates a handover back to the previous stable radio link if the handover to BTS 54 is unsuccessful for any reason.

After the return handover is completed, Zadeh waits a period of time so that the user of mobile station 150 does not experience a series of short disruptions in service. BSC 32 initiates a second handover to BTS 56, wherein BTS 56 generates another TA value as part of the handover procedure. Having obtained three TA values, BSC 32 sends the TA values to MSC 14 along with the BTS's identities. MSC 14 sends this information to MPC 20, which makes the location determination based on the information..

Applicant submits that no motivation exists either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify or combine *Dennison* in view of *Zadeh* for at least the following reasons. First, one of ordinary skill in the art would not rely upon the teaching of *Zadeh* to modify *Dennison* because *Zadeh* teaches away from *Dennison*. Specifically, *Zadeh* is related only to the detection of the position of a mobile station by means of measuring different Timing

Advance (TA) values between the MS and one or more BTS. However, *Zadeh* is not related to the question of executing a handover such as *Dennison*. Although handovers are used in *Zadeh* for the determination of the TA values, the initialization of the processing according to *Zadeh* based on the need for achieving the location of the mobile station (*Zadeh*, column 4, line 15) and not on the need for performing a handover.

For at least this reason, it would not have been obvious to one skilled in the art at the time of the invention to combine or modify *Dennison* in view of *Zadeh*.

Even if the references are combined, (which would not have been obvious for the reasons set forth above), the combination still does not render the present invention obvious. The combination of *Dennison* in view of *Zadeh* does not disclose or suggest every limitations of the claimed invention. First, the Office Action admits that *Dennison* fails to teach or disclose the step of deciding on the basis of the result of the processing step, whether a first handover condition based on location information is fulfilled or not, when the first handover condition is not fulfilled, checking subscriber specifications, whether or not another measurement related to a handover is to be performed, wherein the another measurement results in a determination of a second handover condition. Second, the Office Action also conceded that *Dennison* fails to disclose a step of designating a next base transceiver station in the communication network, to which the communication with the mobile station is to be directed from a current base transceiver station, when the first handover or the second handover condition is fulfilled.

Third, *Zadeh* does not cure the deficiencies that the Office Action admits exist within *Dennison*. Although *Zadeh* discloses a handover back and a second handover which may be performed after the first handover, *Zadeh* fails to disclose several elements of the claims. For instance, *Zadeh* fails to disclose or suggest the step of checking subscriber specifications, whether or not another measurement, which is related to a handover and is not based on the location information is performed. *Zadeh* discloses in column 4, lines 32 through 37 that a handover back to the original servicing BTS may be performed to facilitate the stability of a voice or data call. However, in performing the handover back to the original servicing BTS, *Zadeh* does not check the subscriber specifications to determine whether or not another measurement is performed. Furthermore, when *Zadeh* performs the second handover (*Zadeh*, column lines 39 through 48), *Zadeh* performs another measurement which is based upon the TA value. As discussed above and as explain in column 4, lines 8 through 11, the TA values are based upon the location information. However, claim 27 and 43 recites that the step of checking the subscriber specification, whether or not another measurement, which is related to a handover and is not based on said location information.

Furthermore, the first handover according to the present invention is based upon whether or not a change of cell is necessary to establish or maintain a connection to and from the mobile station. However, the combination of *Dennison* and *Zadeh* fails to disclose such a first handover.

Another difference between the combination of *Dennison* and *Zadeh* and the present invention is that the cited combination does not disclose or suggest “checking the subscriber specification.” Rather, *Zadeh* merely discusses in Step 208 checking whether enough TA values for locating the mobile stations. As shown in Figure 2, if there are not enough TA values in Step 208, a handover of the MS is performed to a BTS on the list in Step 210.

The combination of *Dennison* and *Zadeh* further fails to render the claims obvious because neither *Dennison* nor *Zadeh*, taken in combination or alone, discloses “another measurement” as recited in the claims since the next handover condition in *Zadeh* is based on the candidate list which is compiled based upon the location information of the mobile station.

Another patentable distinction between the present invention and the cited references is the order of performing the handover. Specifically, the feature of “designating a next base transceiver station . . . when the first handover or the second handover condition is fulfilled” in the present invention differs from the cited prior art. In Step 208 of *Zadeh*, which the Office Action has interpreted as the “first handover” condition, when the decision is “yes”, this means that the condition has already been fulfilled in the first cycle. However, “no handover” at all has yet been performed in *Zadeh*. This order of operation is definitely in contrast to the present claims.

In view of the above, Applicant respectfully submits that claims 27 through 38 and 43 through 51 each recite subject matter which is neither disclosed nor suggested in the combination of *Dennison* and *Zadeh*.

Claims 39-42 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Dennison* and *Zadeh* in view of *Menich* (WO 93/19560). The Office Action took the position that *Dennison* and *Zadeh* disclose all of the elements of the claimed invention of claims 39 through 42, with the exception of teaching that the coverage area of a base station designated in said designating step and to which the communication is to be directed as a coverage area not adjacent to the coverage area of the current base transceiver station. *Menich* was cited as curing the deficiencies of *Dennison* and *Zadeh* and the Office Action took the position that it would have been obvious to a person of ordinary skill in the art to combine *Dennison*, *Zadeh* and *Menich* to yield the claimed invention. Applicant respectfully submits that the presently pending claims recite subject matter which is neither disclosed nor suggested in the cited prior art.

Menich discloses a directional handover control in digital mobile radio systems employing Mobile Assisted Handover (MAHO). *Menich* discloses a method of selecting handover targets for a communication unit exchanging a communicated signal through a serving base site in a digital cellular system. *Menich* uses timing advance to determine a relative distance of a communication to the serving base site. *Menich* compares a timing advance value with a first threshold. When the timing advance value exceeds the first threshold, a base site frequency list is modified to include base sites non-adjacent the

serving base site. The next handover target may be selected from the modified base site frequency list.

Claim 39-42 depends from claim 27 and are therefore allowable for the reasons claims 27 is allowable and for the specific recitations therein. Furthermore, the claimed invention is patentable over the combination of *Dennison*, *Zadeh* and *Menich* because *Menich* does not overcome the deficiency regarding the combination of *Dennison* and *Zadeh* discussed above.

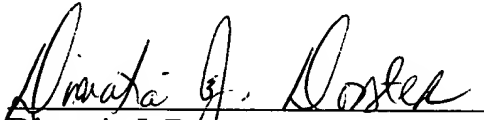
Thus, Applicant respectfully submits that the claimed invention is patentable over the cited references.

Applicant submits that *Dennison*, *Zadeh* and *Menich*, when viewed either singly or as combined as proposed in the Office Action, fail to disclose or suggest several limitations of the claimed invention as discussed above. Thus, Applicant submits that certain clear and important distinctions exist between the cited prior art and the claimed invention. Applicant submits that these distinctions are more than sufficient to render the claims of the invention unanticipated by and unobvious in view of the prior art. It is therefore respectfully requested that claims 27-51 be found allowable, and the application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Dinnatia J. Doster", written over a horizontal line.

Dinnatia J. Doster
Registration No. 45,268

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802

DJD:cct

Enclosures: Petition for Extension of Time